

CLAIMS

1. A hydrodynamic bearing arrangement for a rotatable shaft, the arrangement including a housing in which is provided a shaft support with an opening through which the shaft extends, there being a space between the shaft support and the shaft, the shaft support including at least one passage therethrough which extends generally axially of the shaft from a first side of the shaft support to a chamber provided in the housing at a second side of the shaft support so that liquid at the first side of the shaft support may communicate with the chamber at the second side of the shaft support and thus pass into the space between the shaft and the shaft support from both the first side of the shaft support and from the second side of the shaft support via the passage and the chamber, the liquid between the shaft and the shaft support maintaining the space between the shaft and shaft support and providing a hydrodynamic bearing for the shaft.
2. A hydrodynamic bearing arrangement according to claim 1 wherein the shaft is the drive shaft of a pump, and the fluid at the first side of the shaft support is pumped fluid.
3. A hydrodynamic bearing arrangement according to claim 1 or 2 wherein the shaft support is provided with a plurality of generally axially extending passages which are arranged in an array around the shaft.
4. A hydrodynamic bearing arrangement according to any preceding claim where a seal is provided between the housing and the shaft to close the chamber and prevent leakage of fluid from the chamber.

5. A hydrodynamic bearing arrangement according to any preceding claim wherein the shaft support includes two generally annular support parts which are spaced axially along the shaft.
- 5 6. A hydrodynamic bearing arrangement according to claim 5 wherein the shaft is provided with an annular plate which extends radially between the two support parts.
7. A hydrodynamic bearing arrangement according to claim 6 wherein
10 there is a space between the annular plate and each of the support parts, and each support part includes two passages which extend generally parallel to the shaft, an outer one of which is located radially outwardly of the annular plate, and an inner one of which is located such that one end is adjacent to the annular plate.
- 15 8. A hydrodynamic bearing arrangement according to any preceding claim wherein the shaft support is provided with a plurality of inner passages and a plurality of outer passages which are arranged in two arrays around the shaft.
- 20 9. A pump including a housing enclosing a pumping chamber and a rotatable pumping part mounted in the pumping chamber on a drive shaft, the pump being provided with a shaft support with an opening through which the drive shaft extends, there being a space between the shaft support and the drive shaft, the shaft support including at least one passage therethrough which
25 extends generally axially of the drive shaft from the first side of the shaft support, which is in communication with the pumping chamber, to a secondary chamber provided in the housing at second side of the shaft support so that pumped fluid in the pumping chamber may communicate with the chamber at the second side of the shaft support and thus pass into the space between the

drive shaft and the shaft support from both the first side of the housing and from the second side of the housing via the passage and the chamber, the liquid between the drive shaft and the shaft support maintaining the space between the drive shaft and shaft support and providing a hydrodynamic bearing for the

5 drive shaft.